

Apple No. 10/796,597
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Reply to Office action of April 16, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for driving a plasma display panel (PDP) comprising a plurality of first electrodes and second electrodes ~~formed~~ in parallel on a first substrate, and a plurality of third electrodes crossing the first and second electrodes and being ~~formed~~ on a second substrate, ~~wherein adjacent~~ said first, second, and third electrodes ~~define each of~~ defining a plurality of discharge cells, the PDP being driven during a plurality of subfields of a frame, at least one of the plurality of subfields comprising a first reset period, a second reset period immediately following the first reset period, an address period and a sustain period, the method comprising:

setting the plurality of discharge cells in [[a]] the first reset period;

further setting the plurality of discharge cells in [[a]] the second reset period;

selecting at least one discharge cell from among the plurality of discharge cells in [[an]] the address period; and

~~sustain-discharging~~ said at least one discharge cell in [[a]] the sustain period.

2. (Original) The method of claim 1, wherein said further setting comprises applying a discharge erase pulse under a predetermined condition to the plurality of-discharge cells, said discharge erase pulse having discharge and erase functions.

3 (Original) The method of claim 2, wherein the predetermined condition comprises a case in which abnormal charges are formed in the first reset period, and the abnormal charges formed in the first reset period are discharged and erased responsive to the discharge erase pulse.

4. (Original) The method of claim 3, wherein the abnormal charges comprise first and second charges respectively formed on the first and second electrodes in the first reset period, and a voltage caused by the first and second charges is sufficient for sustaining in the sustain period discharge cells that are not selected in the address period.

5. (Original) The method of claim 4, wherein the second reset period comprises a first period and a second period, and said further setting comprises:

applying a first voltage to the first electrode during the first period; and
applying a second voltage to the second electrode during the second period.

6. (Original) The method of claim 5, wherein the first voltage, together with the voltage caused by the first and second charges, is sufficient for generating a discharge between the first and second electrodes.

7. (Original) The method of claim 6, wherein the first voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

8. (Original) The method of claim 6, wherein charges accumulate responsive to the discharge in the first period to the first and second electrodes, and the second voltage is used in the second period to erase the charges formed in the first period.

9. (Original) The method of claim 8, wherein the second voltage gradually changes from a third voltage to a fourth voltage.

10. (Original) The method of claim 8, wherein the second voltage, together with a voltage caused by the charges formed in the first period, is sufficient for generating another discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the second period responsive to said another discharge is less than a predetermined amount of charges.

11. (Original) The method of claim 10, wherein the predetermined amount is within a range that prevents sustaining in the sustain period of the discharge cells that are not selected.

12. (Original) The method of claim 4, wherein a second voltage is applied to the second electrode while a first voltage is applied to the first electrode in the second reset period.

13. (Original) The method of claim 12, wherein the first voltage is applied to the first electrode during a predetermined period,

a voltage difference between the first and second voltages, together with a voltage caused by the first and second charges, is sufficient for generating a discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the predetermined period responsive to the discharge is less than a predetermined amount of charges.

14. (Original) The method of claim 13, wherein the predetermined amount is within a range that prevents sustaining in the sustain period of discharge cells that are not selected.

15. (Original) The method of claim 13, wherein the first voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

16. (Original) The method of claim 13, wherein the first voltage gradually changes from a third voltage to a fourth voltage.

17. (Original) The method of claim 1, further comprising additionally setting the plurality of discharge cells at least once more in at least one additional reset period.

18. (Original) The method of claim 17, wherein each of the second reset period and the at least one additional reset period comprises a first period and a second period, and each of said further setting and said additionally setting comprises:

applying a first voltage to the first electrode during the first period; and
applying a second voltage to the second electrode during the second period.

19. (Original) The method of claim 18, wherein the first voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

20. (Original) The method of claim 18, wherein the first voltage gradually changes from a third voltage to a fourth voltage.

21. (Original) The method of claim 20, wherein the fourth voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

22. (Original) The method of claim 18, wherein the second voltage gradually changes from a fifth voltage to the sixth voltage.

23. (Original) The method of claim 22, wherein the fifth voltage has a voltage level substantially identical to that applied to the second electrode for discharging in the sustain period.

24. (Original) The method of claim 17, wherein each of the second reset period and the at least one additional reset period comprises a first period and a second period, and each of said further setting and said additionally setting comprises at least one of, applying a first voltage to the first electrode during the first period, and applying a second voltage to the second electrode during the second period.

25. (Original) The method of claim 24, wherein the first voltage gradually changes from a third voltage to a fourth voltage during the second reset period, and the second voltage gradually changes from a fifth voltage to a sixth voltage during the at least one additional reset period.

26. (Original) The method of claim 25, wherein the sixth voltage has a voltage level substantially identical to that applied to the second electrode for discharging in the sustain period.

27. (Original) The method of claim 25, wherein the fourth voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

28. (Original) The method of claim 24, wherein the first voltage gradually changes from a third voltage to a fourth voltage during the second reset period, and the first voltage gradually changes from the fourth voltage to the third voltage during the at least one additional reset period.

29. (Original) The method of claim 28, wherein the third voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

30. (Original) The method of claim 28, wherein the fourth voltage has a voltage level substantially identical to that applied to the first electrode for discharging in the sustain period.

31. (Currently Amended) A method for driving a plasma display panel (PDP) comprising a plurality of first electrodes and second electrodes ~~formed~~ in parallel on a first substrate, and a plurality of third electrodes crossing the first and second electrodes and being ~~formed~~ on a second substrate, ~~wherein adjacent~~ said first, second, and third electrodes ~~define each of defining~~ a plurality of discharge cells, the PDP being driven during a plurality of subfields of a frame, at least one of the plurality of subfields comprising a reset period and an erase period following the reset period, the method comprising:

setting the plurality of discharge cells during the erase period ~~when a predetermined depending on a charge~~ condition is provided in [[a]] the reset period, said setting including generating a discharge and erasing, which comprise:

applying to the plurality of discharge cells a discharge pulse for generating the discharge between the first and second electrodes under the ~~predetermined~~ charge condition in the reset period; and

applying to the plurality of discharge cells an erase pulse for erasing [[the]] charges formed on the first and second electrodes responsive to the discharge.

32. (Currently Amended) The method of claim 31, wherein the ~~predetermined charge~~ condition for setting the plurality of discharge cells comprises a case in which abnormal charges have been formed in the reset period.

33. (Original) The method of claim 32, wherein the abnormal charges comprise first and second charges respectively formed on the first and second electrodes in the reset period, and

a voltage caused by the first and second charges is sufficient for sustain-discharging in a sustain period discharge cells that are not selected in an address period.

34. (Original) The method of claim 33, wherein said setting the plurality of discharge cells comprises applying the discharge pulse having a first voltage to the first electrode while the second electrode is maintained at a second voltage, wherein a voltage difference between the first and second voltages, together with the voltage caused by the first and second charges, is sufficient to generate a discharge between the first and second electrodes.

35. (Original) The method of claim 34, wherein said applying the erase pulse comprises applying to the second electrode the erase pulse that gradually rises from a fourth voltage to a fifth voltage while the first electrode is maintained at a third voltage, and

a voltage difference between the fifth and third voltages, together with a voltage caused by the charges formed on the first and second electrodes from the discharge generated through applying the discharge pulse, is sufficient to generate another discharge between the first and second electrodes

36. (Original) The method of claim 34, said applying the erase pulse comprises applying to the second electrode the erase pulse that gradually falls from a fourth voltage to a fifth voltage while the first electrode is maintained at a third voltage, and

a voltage difference between the third and fifth voltages, together with a voltage caused by the charges formed on the first and second electrodes from the discharge generated through applying the discharge pulse, is sufficient to generate another discharge between the first and second electrodes.

37. (Original) The method of claim 34, wherein said applying the erase pulse comprises applying to the second electrode the erase pulse having a fourth voltage for a predetermined period while the first electrode is maintained at a third voltage,

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a voltage difference between the fourth and third voltages, together with a voltage caused by the charges formed on the first and second electrodes from the discharge generated through applying the discharge pulse, is sufficient to generate another discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the predetermined period out of the charges formed by discharging between the first and second electrodes is less than a predetermined amount of charges.

38. (Original) The method of claim 37, wherein the predetermined amount is within a range that prevents discharging between the first and second electrodes when voltages of levels substantially identical to voltage levels respectively applied to the first and second electrodes are applied to the first and second electrodes in a sustain period.

39. (Currently Amended) A method for driving a plasma display panel (PDP) comprising a plurality of first electrodes and second electrodes ~~formed~~ in parallel on a first substrate, and a plurality of third electrodes crossing the first and second electrodes and being ~~formed~~ on a second substrate, ~~wherein adjacent the first, second, and third electrodes define one of~~ defining a plurality of discharge cells, the PDP being driven during a plurality of subfields of a frame, at least one of the plurality of subfields comprising a reset period and a setting period immediately following the reset period, the method comprising:

setting the plurality of discharge cells during the setting period when a predetermined condition is provided in [[a]] the reset period, said setting including generating a discharge and erasing, which comprise: applying to the plurality of discharge cells an erase pulse for generating the discharge between the first and second electrodes and erasing charges under the predetermined condition.

40. (Original) The method of claim 39, wherein the predetermined condition comprises a case in which abnormal charges have been formed in the reset period.

41. (Original) The method of claim 40, wherein the abnormal charges comprise first and second charges respectively formed on the first and second electrodes, and
a voltage caused by the first and second electrodes is sufficient for sustain-discharging in a sustain period discharge cells that are not selected in an address period.

42. (Original) The method of claim 41, wherein said applying the erase pulse comprises applying the erase pulse having a second voltage for a predetermined period to the first electrode while the second electrode is maintained at a first voltage,
a voltage difference between the second and first voltages, together with a voltage caused by the first and second charges, is sufficient for generating a discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the predetermined period out of the charges formed by discharging between the first and second electrodes less than a predetermined amount of charges.

43. (Original) The method of claim 42, wherein the predetermined amount is within a range that prevents discharging between the first and second electrodes when voltages having levels substantially identical to voltage levels respectively applied to the first and second electrodes are applied to the first and second electrodes in a sustain period.

44. (Original) The method of claim 41, wherein the erase pulse that gradually changes from a second voltage to a third voltage is applied to the first electrode while the second electrode is maintained at a first voltage.

45. (Original) The method of claim 44, wherein the voltage difference between the third and first voltages, together with a voltage caused by the first and second charges, is sufficient to generate a discharge between the first and second electrodes.

46. (Currently Amended) A plasma display panel (PDP) comprising:
a first substrate;
a plurality of first and second electrodes ~~respectively formed~~ substantially in parallel on the first substrate;
a second substrate facing the first substrate with a predetermined distance therebetween;
a plurality of third electrodes crossing the first and second electrodes, and being ~~formed~~ on the second substrate; and
a driving circuit for supplying a driving signal to a discharge cell defined by adjacent said first, second, and third electrodes, the driving circuit for driving the PDP during a plurality of subfields of a frame, at least one of the plurality of subfields comprising a reset period and an address period,
wherein the driving circuit applies a first voltage to the first electrode and a second voltage to the second electrode between the reset and address periods, and abnormal charges from among [[the]] charges formed in the reset period are erased by the first and second voltages.

47. (Original) The PDP of claim 46, wherein the abnormal charges comprise first and second charges respectively formed on the first and second electrodes, wherein the first and second charges are sufficient to generate a discharge in a sustain period when the discharge cell is not selected in the address period.

48. (Original) The PDP of claim 47, wherein the driving circuit applies the first voltage to the first electrode during a first period, and the second voltage to the second electrode during a second period, and
when the first and second charges are formed during the reset period, discharging occurs between the first and second electrodes responsive to the first voltage during the first period, and

charges formed by discharging in the first period are erased responsive to the second voltage during the second period.

49. (Original) The PDP of claim 48, wherein, during the first period, the driving circuit applies the first voltage to the first electrode while maintaining the second electrode at a third voltage, and

a voltage difference between the first and second voltages, together with a voltage caused by the first and second charges, is sufficient to generate a discharge between the first and second electrodes.

50. (Original) The PDP of claim 49, wherein, during the second period, the driving circuit applies the second voltage to the second electrode while maintaining the first electrode at a fourth voltage,

the second voltage gradually changes from a fifth voltage to a sixth voltage, and

a voltage difference between the sixth and fourth voltages, together with a voltage caused by the charges formed through discharging between the first and second electrodes, is sufficient to generate another discharge between the first and second electrodes.

51. (Original) The PDP of claim 49, wherein, during the second period, the driving circuit applies the second voltage to the second electrode while maintaining the first electrode at a fourth voltage,

a voltage difference between the second and fourth voltages, together with a voltage caused by the charges formed through discharging between the first and second electrodes, is sufficient to generate another discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the second period of the charges formed by discharging said another discharge is less than a predetermined amount of charges.

52. (Original) The PDP of claim 51, wherein the predetermined amount is within a range that prevents discharging between the first and second electrodes when voltages of levels substantially identical to voltage levels respectively applied to the first and second electrodes are applied to the first and second electrodes in a sustain period.

53. (Original) The PDP of claim 47, wherein the driving circuit applies the second voltage to the second electrode, and the first voltage to the first electrode, and the first and second charges are erased responsive to the first and second voltages.

54. (Original) The PDP of claim 53, wherein the driving circuit applies the first voltage for a predetermined period,

a voltage difference between the first and second voltages, together with a voltage caused by the first and second charges, is sufficient to generate a discharge between the first and second electrodes, and

charges accumulated to the first and second electrodes in the predetermined period out of the charges formed by discharging between the first and second electrodes is less than a predetermined amount of charges.

55. (Original) The PDP of claim 54, wherein the predetermined amount is within a range that prevents discharging between the first and second electrodes when voltages of levels substantially identical to voltage levels respectively applied to the first and second electrodes are applied to the first and second electrodes in a sustain period.

56. (Original) The PDP of claim 53, wherein the second voltage gradually changes from a third voltage to a fourth voltage, and

a voltage difference between the fourth and first voltages, together with a voltage caused by the first and second charges is sufficient for generating a discharge between the first and second electrodes.

57. (Original) The PDP of claim 46, wherein the driving circuit applies the first voltage to the first electrode and the second voltage to the second electrode at least once more between the reset and address periods.

58. (Original) The PDP of claim 57, wherein at least one of the first and second voltages gradually changes from a third voltage to a fourth voltage.

59. (Original) The PDP of claim 57, wherein the second voltage gradually changes from a third voltage to a fourth voltage during a first application of the first and second voltages, and the first voltage gradually changes from a fifth voltage to a sixth voltage during a second application of the first and second voltages.

60. (Original) The PDP of claim 57, wherein the first voltage gradually changes from a third voltage to a fourth voltage during a first application of the first and second voltages, and the first voltage gradually changes from the fourth voltage to the third voltage during a second application of the first and second voltages.

61. (Original) The PDP of claim 46, wherein the first voltage gradually changes from a third voltage to a fourth voltage during a first period, and the second voltage gradually changes from a fifth voltage to a sixth voltage during a second period, wherein the first and second periods are between the reset and address periods.

62. (Original) The PDP of claim 46, wherein the first voltage gradually changes from a third voltage to a fourth voltage during a first period, and the first voltage gradually changes from the fourth voltage to the third voltage during a second period, wherein the first and second periods are between the reset and address periods.